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EXAMINER	
REGO, DOMINIC E	

ART UNIT	PAPER NUMBER
2684	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/852,469	WIDROW, BERNARD	
	Examiner	Art Unit	
	Dominic E. Rego	2684	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 May 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1-3 and 9-16* is/are allowed.

6)☐ Claim(s) *4-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 4 is rejected under 35 U.S.C. 102(b) as being anticipated by Takahashi et al. (US Patent #5,392,148).

Regarding claim 4, Takahashi teaches a two-way communication system, based on adaptive filtering, for simultaneous transmission and reception of information signals through a channel of coaxial cable or twisted pair cable (See figure 2 and 3 and Column 1, line: 39-41: Takahashi teaches a power source is multiplexed to a signal from the modulation device 301 and the resultant signal is supplied to a terminal 401 through a coaxial cable 400) comprising:

(a) a first source of data signals (Figure 2, input of signal 1), a first data receiver (Figure 2, output of signal-2), and a first 2-way terminus device connected by means of its 2 -way terminal to the first end of said channel, connected by means of its input terminal to said first source of data signals (Figure

3, element 401), and connected by means of its output terminal to said first data receiver (Figure 3, element 403), and

(b) a second source of data signals (Figure 2, input of signal-2), a second data receiver (Figure 2, output of signal-2), and a second 2-way terminus device connected by means of its 2-way terminal to the second end of said channel, connected by means of its input terminal to said second source of data signals (Figure 3, element 407), and connected by means of its output terminal to said second data receiver (Figure 3, element 408), so that signals can be sent from the first source of data signals to the second receiver and from the second source of data signals to the first receiver without interference.

Claims 5-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Niki (US Patent #5,812,933).

Regarding claim 5, Niki teaches a 2-way repeater amplifier device (Figure 7, elements 92A and 92B), based on adaptive filtering, comprising:

(a) a first cable or channel and a second cable or channel (Figure 7, elements 13A,14A and 13B,14B).

(b) a first 2-way terminus device (Figure 7, elements 11A and 11B) and a second 2-way terminus device (Figure 7, elements 12A and 12B),

c) a connection connecting the one end of the first cable or channel to the 2-way terminal of said first 2-way terminus device (Figure 7, element 11A), and a

connection connecting one end of the second cable or channel to the 2-way terminal of said second 2-way terminus device (Figure 7, element 12A),

(d) a crisscross connection between said first and second 2-way terminus devices, said crisscross connection connecting the output terminal of said first 2-way terminus device to the input terminal of said second 2-way terminus device, and connecting the output terminal of said second 2-way terminus device to the input terminal of said first 2-way terminus device (Figure 7, elements 92A and 92B are two repeaters with 2 terminals each side which do the same thing as above device).

Regarding claim 6, Niki teaches a two-way communication system, based on adaptive filtering, for simultaneous transmission and reception of information signals through a channel of coaxial cable or twisted pair cable (Figure 7, elements 13A,14A and 13B,14B) requiring repeater amplification (Figure 7, elements 92A and 92B), comprising:

(a) a first 2-way terminus device having an input terminal connected to input signal source A (Figure 7, an input terminal 11A connected to input signal source 81), an output terminal for outputting an amplified signal B (Figure 7, an output terminal 12A for outputting an amplified signal), and a 2-way terminal connected to the first end of a first coaxial cable or twisted pair channel (Figure 7, elements 13A and 13B are a first coaxial cable connected to the terminals 11A and 11B),

(b) a 2-way repeater amplifier device whose first 2-way terminal is connected to the second end of said first channel and whose second 2-way terminal is connected to the first end of a second coaxial cable or twisted pair channel (Figure 7, elements 92A and 92B are two repeaters with 2 terminals each side which do the same thing as above device), and

(c) a second 2-way terminus device whose 2-way terminal is connected to the second end of said second coaxial cable or twisted pair channel (Figure 7, elements 14A and 14B are a second coaxial cable connected to the terminals 12A and 12B), whose input terminal is connected to input signal source B (Figure 7, element 12B is a input terminal for inputting signal), and whose output terminal outputs an amplified signal A (Figure 7, an output terminal 11B for outputting an amplified signal).

Regarding claim 7, Niki teaches the two-way communication system, wherein said coaxial cable or twisted pair channel incorporates two or more 2-way repeater amplifier devices for two way signal transmission over long distances (Figure 7, elements 92A and 92B are two 2-way repeater amplifier device for two way signal transmission).

Regarding claim 8, Niki teaches the 2-way repeater amplifier device (Figure 7, elements 92A and 92B) wherein said 2-way terminus devices connected with a crisscross connection have digitally-implemented adaptive filters (Figure 7,

elements 92A and 92B are two repeaters with 2 terminals each side which do the same thing and inherently digitally-implemented a filter. Also see figure 5 for A/D converter) and have at least one sample time or one unit of delay along the closed-loop path (Column 4, line 44-54: Niki teaches with reference to FIG. 1, two-way RF repeaters 92A and 92B constructed in accordance with this invention are installed on top of respective poles 101A and 101B, and coupled to the base station 81 through suitable coaxial cables 13, 14 and RF radiation cable 15. RF signals transmitted from the base station 81 are sent through the coaxial cables 13, 14 and RF radiation cable 15 (these must be of equal length with respect to the base station to obtain equal time delay) to two-way RF repeaters 92A and 92B, and amplified and radiated through the antenna to the mobile subscribers 82) which includes said crisscross connection, said digitally-implemented adaptive filters, and two difference amplifiers or signal subtractors (Figure 7, elements 6 and 7 are two difference amplifiers).

Allowable Subject Matter

Claims 1-3 and 9-16 are allowed.

Regarding claim 1, the closest prior art cited discloses/teaches (Takahashi et al. (US Patent #5,392,148) a 2-way terminus device based on adaptive filtering, for connecting both a signal source and a signal receiver to an end of a cable

or wire channel for simultaneous transmission and reception of data signals in the same frequency band in said cable or wire channel (See figure 2), comprising:

Other prior art such as (a) Soli et al. (US Patent #6,563,931) teaches a signal source and a first isolation amplifier, and an adaptive filter whose input is connected to said signal source through said first isolation amplifier (Column 11, line 17-40: Soli teaches A source of input signal 74 provides the input signal to adaptive filter 16 which is sought to be filtered to eliminate an unwanted component. Input signal source 74 may be, for instance, the microphone of an equipment operator's headset, for example the headset of a fighter pilot or tank operator. In such cases, the background noise sought to be eliminated is the noise from the equipment being operated, for instance the noise present in the cockpit of a jet or inside a tank, with respect to the examples above-noted. The adaptive filter 16 can be used to filter out the noise from the equipment from the speech component of the microphone input thus enhancing the clarity of the voice on the receiving end of the communication system, which is generally indicated in block 76. Adaptive filter 16 is also useful to filter an input signal in measurement instrumentation applications wherein the signal of interest is obtained, for instance, from an instrumentation probe such as an oscilloscope probe or a thermocouple probe. In these case the noise sought to be eliminated would be unwanted electrical background noise and the filtered input signal would be applied, for instance, to measurement instrumentation amplifiers or other measurement

instrumentation signal processing circuits, as also generally indicated by block 76).

Other prior art, specifically (b) Knittle et al. (US Patent #5,999,901) teaches a difference amplifier, and a connection between the output of said adaptive filter and the negative input of said difference amplifier (Column 8, 27- 33: Knittle teaches adaptive filter 44 comprises: a tapped delay line 70 having a bulk delay element 60 and a plurality of standard delay elements 62, a plurality of tap coefficient multipliers 64, a summing amplifier 66 for summing the weighted tap results, and a difference amplifier 68 for subtracting the result of the summing amplifier 66 from a received echo signal to produce error signal e(n)). However, none of the prior art of record, either in alone or in combination disclose or provide the motivation to

c) a connection between said cable or wire channel and the positive input of said difference amplifier, connected to an output terminal to provide a connection to said signal receiver, the output of said difference amplifier, being the received signal,

(d) a connection between the output of said difference amplifier and the error signal input of said adaptive filter,

(e) a connection between the output of said first isolation amplifier and a small signal delay unit .DELTA. whose output provides an input to a second isolation amplifier, said second isolation amplifier having the capability for signal amplification while driving a low impedance load, said delay unit having delay ranging from zero to the time duration of the impulse response of said adaptive filter,

(f) a connection between the output of said second isolation amplifier and a first terminal of an impedance whose impedance value is equal to the characteristic impedance of said cable or wire channel,

(g) a connection between the second terminal of said impedance and the said cable or wire channel, thus providing a two-way signal connection between said 2-way terminus device and said cable or wire channel, and

(h) an adaptive algorithm stored in and implemented by said adaptive filter for the purpose of minimization of the mean square of said error.

Regarding claim 9, the prior art of record, specifically Lovoi (US Patent #6,480,699) teaches a two way-wireless communication system for simultaneous transmission and reception of information signals in the same frequency band or in overlapping frequency bands (See figure 2A) comprising:

(a) a radio transmitter, a radio receiver, and an antenna (Figure 2A, element 234 is a signal transmitter, antenna 160 which transmits reply signal 120 and receives power signal 110 which have receiver),

(b) a coupling means such as a transformer (Column 12, line 35-49: Lovoi teaches lines 422 and 431 are conductive lines, each line having an impedance of, e.g. 50 ohms and carrying an electrical signal oscillating at a frequency in the radio frequency range, e.g. range of 2.3 to 2.5 GHz. Lines 422, 431 and other such lines have dimensions that are apparent to an electrical engineer skilled in the design of

radio frequency components, in view of the disclosure. For examples of impedence matching striplines (such as tapered lines and quarter wavelength transformers), see the book Lines, Waves and antennas by Brown, Sharpe and Hughes, The Ronald Press C, 1961 that is incorporated by reference herein in its entirety. One example of such a line is a 50 ohm microstrip transmission line implemented in a single integrated circuit die formed of dielectric having a dielectric constant of 4.8 and a thickness of 0.064 inch.), a directional coupler, or some other electric network for connecting said transmitter and said receiver to said antenna (See figure 2A),

(c) an RF modulator and a source of baseband signal to be transmitted, said baseband signal provided as the input to said RF modulator (Figure 4, element 430 is a RF modulator where the signal from element 420 input to it).

Other prior art, such as (d) Jeckeln (US Patent #6,072,364) teaches an RF power amplifier and a delay device for connecting the output of said RF modulator to said RF power amplifier (Figure 1, elements 6 is a RF modulator connected with RF power amplifier 13) serving as the transmitter, the delay time of said delay device being small, ranging from zero to the impulse response duration of said RF amplifier (Column 9, line 59-63: Jeckeln teaches because of the memoryless condition of all components in the feedback loop (D/A converter 6, quadrature modulator 6, power amplifier 13, coupler 7, quadrature demodulator 8 and A/D converter 10), this provides an

accurate measurement of the delay time). However, none of the prior art of record, either in alone or in combination disclose or provide the motivation to

(e) a connection between the output of said RF amplifier and said coupling means to couple the transmitter to said antenna,

(f) a subtractive means, and a connection between said coupling means and the positive input of said subtractive means,

(g) an adaptive filter,

(h) a connection between the output of said RF modulator and the input of said adaptive filter,

(i) a radio receiver, and a connection between the output of said adaptive filter and the negative input of said subtractive means, the output of said subtractive means connected to the input of said radio receiver,

(j) a connection between the output of said subtractive means and the error input of said adaptive filter to provide an error signal for adapting said adaptive filter,

(k) an adaptive algorithm or mathematical procedure implemented by said adaptive filter for adjusting its parameters for minimization of the mean square of said error signal, and

(l) an output terminal of the radio receiver for outputting a received baseband signal.

Regarding claim 10, the prior art of record, specifically Takahashi et al. (US Patent #5,392,148) teaches a 2-way terminus device, incorporating a directional

coupler and based on adaptive filtering, for connecting both a signal source and a signal receiver to an end of cable or wire channel for simultaneous transmission and reception of data signals in the same frequency band or in overlapping bands (See figure 2), comprising:

Other prior art, specifically (a) Soli et al. (US Patent #6,563,931) teaches a first isolation amplifier, and an adaptive filter whose input is connected to said signal source through said first isolation amplifier (Column 11, line 17-40: Soli teaches A source of input signal 74 provides the input signal to adaptive filter 16 which is sought to be filtered to eliminate an unwanted component. Input signal source 74 may be, for instance, the microphone of an equipment operator's headset, for example the headset of a fighter pilot or tank operator. In such cases, the background noise sought to be eliminated is the noise from the equipment being operated, for instance the noise present in the cockpit of a jet or inside a tank, with respect to the examples above-noted. The adaptive filter 16 can be used to filter out the noise from the equipment from the speech component of the microphone input thus enhancing the clarity of the voice on the receiving end of the communication system, which is generally indicated in block 76. Adaptive filter 16 is also useful to filter an input signal in measurement instrumentation applications wherein the signal of interest is obtained, for instance, from an instrumentation probe such as an oscilloscope probe or a thermocouple probe. In these case the noise sought to be eliminated would be unwanted electrical background noise and the filtered input signal

would be applied, for instance, to measurement instrumentation amplifiers or other measurement instrumentation signal processing circuits, as also generally indicated by block 76)

Other prior art, specifically (b) Knittle et al. (US Patent #5,999,901) teaches a difference amplifier, and a connection between the output of said adaptive filter and the negative input of said difference amplifier (Column 8, 27- 33: Knittle teaches adaptive filter 44 comprises: a tapped delay line 70 having a bulk delay element 60 and a plurality of standard delay elements 62, a plurality of tap coefficient multipliers 64, a summing amplifier 66 for summing the weighted tap results, and a difference amplifier 68 for subtracting the result of the summing amplifier 66 from a received echo signal to produce error signal e(n)). However, none of the prior art of record, either in alone or in combination disclose or provide the motivation to

(c) a delay device, and a connection between the adaptive filter input and the input of a delay device, said delay device implementing a small signal delay whose duration could range from zero to the impulse response duration of said difference amplifier,

(d) a connection between the output of said delay device and the input of said second isolation amplifier,

(e) a first impedance device, and a connection between the output of said second isolation amplifier and the first terminal of said first impedance device whose impedance is equal to the characteristic impedance of said cable or wire channel, and a connection

between the second terminal of said first impedance device and the input terminal of said directional coupler,

(f) a connection between the output terminal of said directional coupler and the positive input of said difference amplifier,

(g) a second impedance device, and a second impedance device, and a connection between the output terminal of said directional coupler and the first terminal of said second impedance device whose impedance is equal to the characteristic impedance of said cable or wire channel, and a connection between the second terminal of said second impedance device and ground,

(h) a connection between the 2-way terminal of said directional coupler and said cable or wire channel,

(i) a received output signal, and a connection between the output of said difference amplifier and a terminal for outputting said received output signal,

(j) a connection between the output of said difference amplifier and the error input terminal of said adaptive filter for providing an error signal for the adaptive filter, and

(k) an adaptive algorithm or mathematical procedure implemented by said adaptive filter for adjusting its parameters for minimization of the mean square of said error signal.

Regarding claim 11, the prior art of record, specifically Chatter (US Patent #6,069,879) teaches a two-way signal or information transmission system, based on

adaptive filtering and capable of transmission and reception of DSL (Digital Subscriber Line) signals and simultaneously capable of providing conventional telephone service over a conventional twisted-pair telephone line, configured to utilize DSL signal standards and DSL hardware such as DSLAM (DSL access multiplexer) and DSL modems, comprised of: (a) a telephone central office, (b) a high-speed download-data stream, a low-speed download-data stream, a high speed upload-data stream, and a low-speed upload-data stream, and a two-way internet connection located at said telephone central office, capable of downloading from the internet said high-speed download-data stream and said low-speed download-data stream, and capable of uploading to the internet said high-speed upload-data stream and said low-speed upload-data stream (c) a first DSLAM located at said telephone central office whose input is connected to said Internet connection to receive said high-speed download-data stream, and whose output is connected to provide said low-speed upload-data stream to the Internet connection (d) a first DSL modem located at said telephone central office whose input is connected to said internet connection to receive said low-speed download-data stream, and whose output is connected to provide said high-speed upload-data stream to said internet connection (Column 3, line 8-24: Chatter teaches In summary, however, from one of its important aspects, the invention embraces a method of improving asymmetric digital subscriber telephone line (ADSL) modem interfacing amongst subscribers and a central telephone office(s) in which voice and data are simultaneously exchanged and with downloading from the central office to the subscriber at a relatively high data rate and uploading from the

subscriber at an asymmetric relatively low rate, that comprises, substantially equalizing the downloading and uploading data rates by providing full duplex high speed and low speed channels and transforming the telephone line into two virtual lines, each operating as a full duplex line, whereby the resulting swapping of direction of data exchange of the high and low speed channels produces a virtual symmetric high speed data rate for both uploading and downloading and a virtual symmetric low speed data rate for both uploading and downloading). However, none of the prior art of record, either alone or in combination disclose or provide the motivation to

(e) a first, second, and a third 2-way terminus device, a first signal summer device, a first POTS ("plain old telephone service) splitter capable of passing through high-frequency DSL signals while separating out low-frequency telephone signals, and a telephone exchange switch, all located at said telephone central office,

(f) a connection between the 2-way terminal of said first DSLAM and the 2-way terminal of said first 2-way terminus device, and a connection between the 2-way terminal of said first DSL modem and the 2-way terminal of said second 2-way terminus device,

(g) a connection between the output terminal of said first terminus device and a first input of said first summer device, a connection between the output terminal of said second terminus device and a second input of said first summer device, a connection between the output of said summer device and the input terminal of said third 2-way terminus device, and a connection between the output terminal of said third way 2-way

terminus device and the input terminals of both said first and second 2-way terminus devices,

(h) a connection between the 2-way terminal of said third 2-way terminus device and a first wideband terminal of said first POTS splitter, and a connection between the narrowband terminal of said first POTS splitter and the telephone exchange switch,

(i) a subscriber location, and said twisted pair telephone line strung between the telephone central office and said subscriber location,

(j) a connection between said telephone line and the second wideband terminal of said first POTS splitter,

(k) a computer capable of downloading and uploading high-speed data streams, a second DSLAM, a second DSL modem, a fourth, fifth and a sixth 2-way terminus device, a second signal summer, a second POTS splitter, and a standard telephone instrument, all located at the said subscriber location,

(l) a first high-speed data stream, a first low-speed data stream, a second high-speed data stream, a second low-speed data stream, a first computer terminal connected to said computer for outputting said first high-speed data stream, a connection between said first computer terminal and the input terminal of said second DSLAM, a second computer terminal connected to said computer for outputting said first low-speed data stream, a connection between said second computer terminal and the input terminal of said second DSL modem, a third computer terminal connected to said computer for inputting said second high-speed data stream, a connection between said third computer terminal and the output terminal of said second DSL modem, a

fourth computer terminal connected to said computer for inputting said second low-speed data stream, and a connection between said fourth computer terminal and the output terminal of said second DSLAM,

(m) a connection between the 2-way terminal of said second DSLAM and the 2-way terminal of said fourth 2-way terminus device, a connection between the 2-way terminal of said second DSL modem and the 2-way terminal of said fifth 2-way terminus device, a connection between the output terminal of said fourth 2-way terminus device, a connection between the output terminal of said fourth 2-way terminus device and the first input of said second signal summer, a connection between the output terminal of said fifth 2-way terminus device and the second input of said second signal summer, a connection between the output of said second summer and the input terminal of said sixth 2-way terminus device, and a connection between the output terminal of said sixth 2-way terminus device and the input terminals of both the said fourth and fifth 2-way terminus devices, and

(n) a connection between the 2-way terminal of said sixth 2-way terminus device and a first wideband terminal of said second POTS splitter, a connection between the second wideband terminal of said second POTS splitter and said telephone line, and a connection between the narrowband terminal of said second POTS splitter and said telephone instrument.

Regarding claim 12, the prior art of record, specifically Dent (US Patent Application Publication #20020080066) teaches a signal or information transmission

system providing wireless individual two-way communication paths between a central antenna array and a plurality of subscriber antenna arrays, all or most communication signals being in the same frequency band, the central array and the distant subscriber arrays all connected respectively to 2-way adaptive beamformers in order to create nulls in their directivity patterns in the directions of all sources of interference, said antenna arrays not transmitting to or receiving from said directions, said information transmission system comprised of:

(a) a central antenna array, a plurality of 2-way adaptive beamformers, at least one individual 2-way adaptive beamformer for each distant subscriber, each of said adaptive beamformers transmitting and receiving through connections with the antenna elements of said central antenna array, each of said 2-way adaptive beamformers comprising, (1) a plurality of adaptive beamformers, whose number is equal to the number of antenna elements of said central antenna array (¶0040: Dent teaches fig.5 depicts a transmitter, indicated generally as 80, for transmitting multiple independently steerable beams using the whole antenna array aperture. The transmitter 80 includes an antenna aperture array 82, columns 84a-84n of power amplifiers 85, beamformers 86a-86n, and a signal router 88. The antenna aperture array 82 includes antenna elements 90 grouped in rows, with each row connected to a respective passive coupler or Butler matrix, and more specifically, matrix 91 for row one, matrix 92 for row two, matrix 93 for row three, matrix 94 for row four, and matrix 95 for row five). However, none of the prior art of record, either alone or in combination disclose or

provide the motivation to (2) coupling devices connecting to each of said elements to the inputs of each of said adaptive filters, a summing device whose inputs are connected to the output of said adaptive filters, a first subtractive device whose positive input is the summed signal of said summing device, a radio receiver whose input signal is the output signal of said subtractive device, the output of said radio receiver being the received baseband signal, a baseband signal to be transmitted which is inputted to an RF modulator, the output of said RF modulator providing inputs to a plurality of controlled filters that correspond one for one to the said adaptive filters, the architecture and weight values of the controlled filters set to correspond at each moment of time, to the corresponding weights of the adaptive filters, a subtracting adaptive filter whose input signal is the output signal of the said RF modulator, whose output signal is inputted to the negative input of said first subtractive device, the output of said first subtractive device provided as the error signal for said subtracting adaptive filter, so that it can subtract the transmitted signal from the radio receiver input, a coded pilot signal generator for generating a pilot signal used while the 2-way adaptive beamformer is trained, said pilot signal inputted to the positive input of a second subtractive device, the output of said summing device connected to the negative input of said second subtractive device, the output signal of said second subtractive device provided as an error signal during training for all of the adaptive filters of said plurality of adaptive filters, a plurality of RF amplifiers to provide RF power for wireless transmission, the input signals for said RF amplifier are the corresponding output signals from said controlled filters, and connections between the output signals from said RF amplifier and the

corresponding said coupling devices provide RF driving currents for the elements of the central antenna array, (3) subtracting adaptive filters configured for canceling all transmitted signals of the central antenna array from the inputs of all of the radio receivers, the number of transmitters and the number of receivers equal to the number of distant subscribers,

(b) a plurality of distant subscriber antenna arrays each connected and configured as part of a system for the two-way communication with the central antenna array, each said system comprised of, (1) a subscriber's array of antenna elements located away from the central antenna array, (2) a 2-way adaptive beamformer connected to the antenna elements of said subscriber's array, (3) an output terminal of the 2-way beamformers for outputting the received baseband signal and an input terminal of the 2-way beamformer for inputting the baseband signal to be transmitted, and (4) a pilot signal generator used during training of subscriber's 2-way beamformers, said pilot signal being random, of finite length, and uncorrelated with all other pilot signals used in said information transmission system.

Regarding claim 14, the prior art of record, specifically Chatter (US Patent #6,069,879) teaches a method for two-way transmission and reception of DSL signals over conventional telephone lines using existing asymmetrical DSL signal standards and existing DSL hardware so that upload and download data rates will be equal to conventional download plus upload rates, comprising the steps of: (a) receiving and transmitting DSL and telephone signals with a telephone line at the central office,

said telephone line connecting said office to a subscriber location (Column 3, line 8-24: Chatter teaches In summary, however, from one of its important aspects, the invention embraces a method of improving asymmetric digital subscriber telephone line (ADSL) modem interfacing amongst subscribers and a central telephone office(s) in which voice and data are simultaneously exchanged and with downloading from the central office to the subscriber at a relatively high data rate and uploading from the subscriber at an asymmetric relatively low rate, that comprises, substantially equalizing the downloading and uploading data rates by providing full duplex high speed and low speed channels and transforming the telephone line into two virtual lines, each operating as a full duplex line, whereby the resulting swapping of direction of data exchange of the high and low speed channels produces a virtual symmetric high speed data rate for both uploading and downloading and a virtual symmetric low speed data rate for both uploading and downloading).

Other prior art, such as Bremer (US Patent #6,154,524) teaches (b) separating said telephone signals from the DSL signals, by means of a POTS splitter, for connection to a telephone exchange switch (Column 1, line 45-62: Because passband DSL signals, such as asymmetric digital subscriber line (ADSL) and rate adaptive digital subscriber line (RADSL) modem signals, typically occupy only the frequency band above the audio band, these DSL signals have traditionally been isolated from all POTS type devices (such as telephones or dial modems) by a splitter or

filter system installed at the user (remote) location. Such a splitter is typically known in the field of telephony communications as a POTS splitter. The POTS splitter typically serves two purposes: (1) it attenuates the DSL signals so that they do not significantly appear at the input of the POTS devices, and (2) it attenuates the POTS so that they do not significantly appear at the input of the DSL devices. In particular, the POTS filter attempts to attenuate DSL signals appearing at the input of the POTS devices in the audio band to an inaudible level, and also attempts to attenuate DSL signals above the audio band to a level low enough so that distortion inside the POTS type devices does not adversely affect their performance),

However, none of the prior art of record, either alone or in combination disclose or provide the motivation to,

(c) separating said receiving and transmitting DSL signals into receiving and transmitting data streams by means of a first 2-way terminus device,

(d) processing said receiving and transmitting data streams with bandpass filters or with 2-way terminus devices, applying the received signal to both a DSLAM and a DSL modem, obtaining and combining high-frequency and low-frequency transmitted signal components from the said DSLAM and DSL modem for transmission to the said telephone line through the first 2-way terminus device, inputting said high-frequency and low-frequency transmitted signal components from an internet connection to the DSLAM and the DSL modem respectively, connecting high and low frequency components of

said received signal from the DSL modem and the DSLAM respectively to the internet connection,

(e) separating the DSL signals from the telephone signals at the subscriber location by means of a POTS splitter,

(f) utilizing the telephone signal by a conventional telephone instrument, and

(g) performing the same operations on the DSL signal at the subscriber location as was done at the telephone central office while substituting a computer with data transfer interfaces in place of the said Internet connection.

Regarding claim 15, the prior art of record, specifically Dent (US Patent Application Publication #20020080066) teaches a method for providing wireless two-way signal or information transmission between a central antenna array and a plurality of subscriber antenna arrays, all of said information transmission taking place simultaneously in a single frequency band, said method comprising the steps of:

(a) connecting a plurality of 2-way subscriber's adaptive beamformers to said central antenna array (¶0040: Dent teaches fig.5 depicts a transmitter, indicated generally as 80, for transmitting multiple independently steerable beams using the whole antenna array aperture. The transmitter 80 includes an antenna aperture array 82, columns 84a-84n of power amplifiers 85, beamformers 86a-86n, and a signal router 88. The antenna aperture array 82 includes antenna elements 90 grouped in rows, with each row connected to a respective passive coupler or Butler matrix, and more specifically, matrix 91 for row one, matrix 92

for row two, matrix 93 for row three, matrix 94 for row four, and matrix 95 for row five).

However, none of the prior art of record, either alone or in combination disclose or provide the motivation to the number of individuals beamformers being equal to the number of subscribers, connecting sources of input baseband signals to all of the signals input terminals of said 2-way adaptive beamformers, deriving the respective baseband output signals from the output terminals of said 2-way adaptive beamformers, providing mutually uncorrelated random pilot signals to be used by the 2-way adaptive beamformers during training,

(b) connecting a 2-way adaptive beamformer to each of the distant subscriber antenna arrays, connecting a source of input baseband signals to the input terminal of each subscriber's 2-way adaptive beamformer, deriving baseband output signals from the output terminal of each subscriber's 2-way adaptive beamformer, providing random pilot signals to be used during training times for training the said subscriber's 2-way adaptive beamformers, said pilot signals being mutually uncorrelated and uncorrelated with the pilot signals used by all the beamformers connected to the central antenna array, and

(c) providing adaptive canceling filter means for subtracting all transmitted signals from the radio receiver inputs of the 2-way adaptive beamformers connected to the central antenna array.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Hatamian (US Patent Application Publication #20050007097) dynamic register with IDDQ testing capability.

Voloshin et al. (US Patent Application Publication #20050018704) teaches synchronous stack bus for fast Ethernet repeater.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dominic E. Rego whose telephone number is 571-272-8132. The examiner can normally be reached on Monday-Friday, 8:30 am-5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nay Maung can be reached on 571-272-7882. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Dominic Edward Rego.

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